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January 1965

PHOTOGRAPHIC INTERPRETATION REPORT

PHOSPHATE FERTILIZER PLANT
TAI-YUAN, CHINA

CIA

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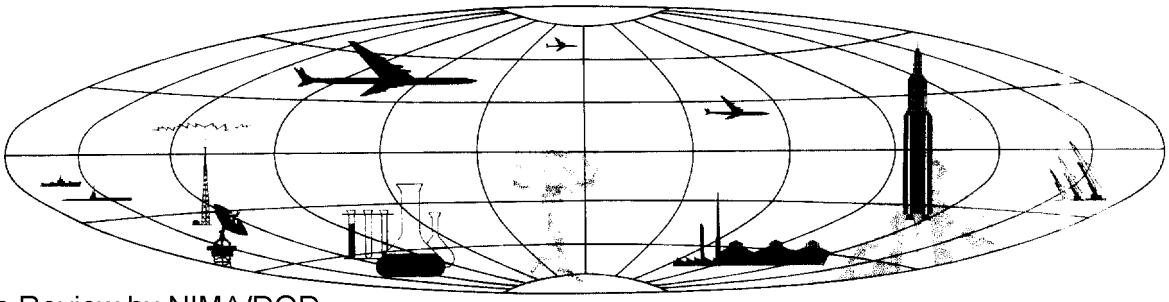
NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER



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PHOSPHATE FERTILIZER PLANT, TAI-YUAN, CHINA

SUMMARY

The Tai-yuan Phosphate Fertilizer Plant is a major producer of phosphate fertilizer for Shan-hsi Sheng (Shansi Province) and is a component of the Tai-yuan Chemical Combine which was constructed with Soviet aid between 25X1D [redacted] 25X1D The plant is suspected of having an elemental phosphorus research or pilot plant section which suggests the capability for manufacturing research 25X9 [redacted] 25X9

INTRODUCTION

The Tai-yuan Phosphate Fertilizer Plant (37-49N 112-29E [redacted] is situated 25X1A in a depression approximately 4.5 nautical miles (nm) southwest of the center of the city of Tai-yuan, China (Figure 1). The plant has been known also as "Chemical Plant No 203." 1/ It is a part of the Tai-yuan Chemical Combine which was constructed with Soviet aid between [redacted] 2/ Other components of the 25X1D combine include the Tai-yuan Chemical Plant [redacted] approximately 1.5 nm to 25X1A

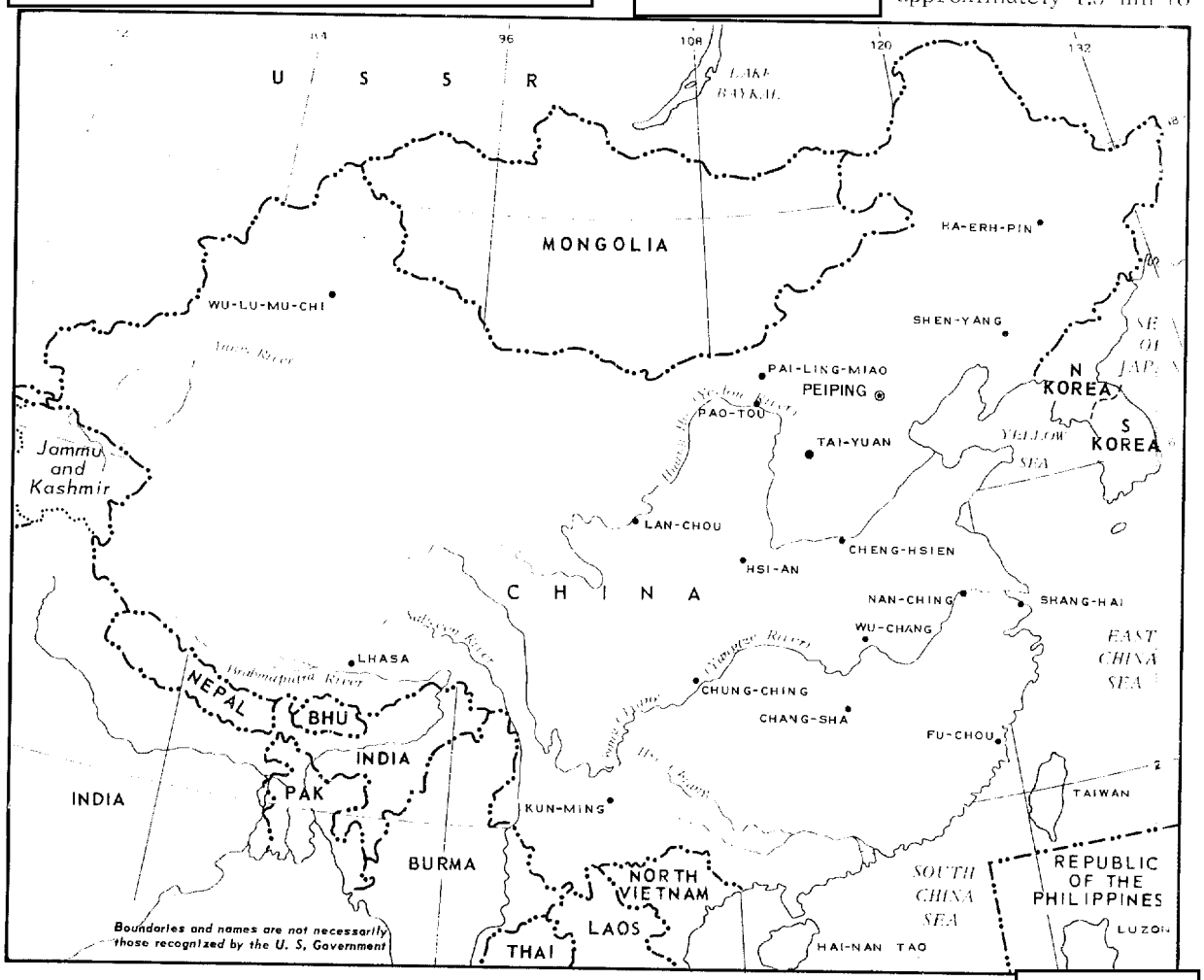

FIGURE 1. LOCATION MAP. 25X1

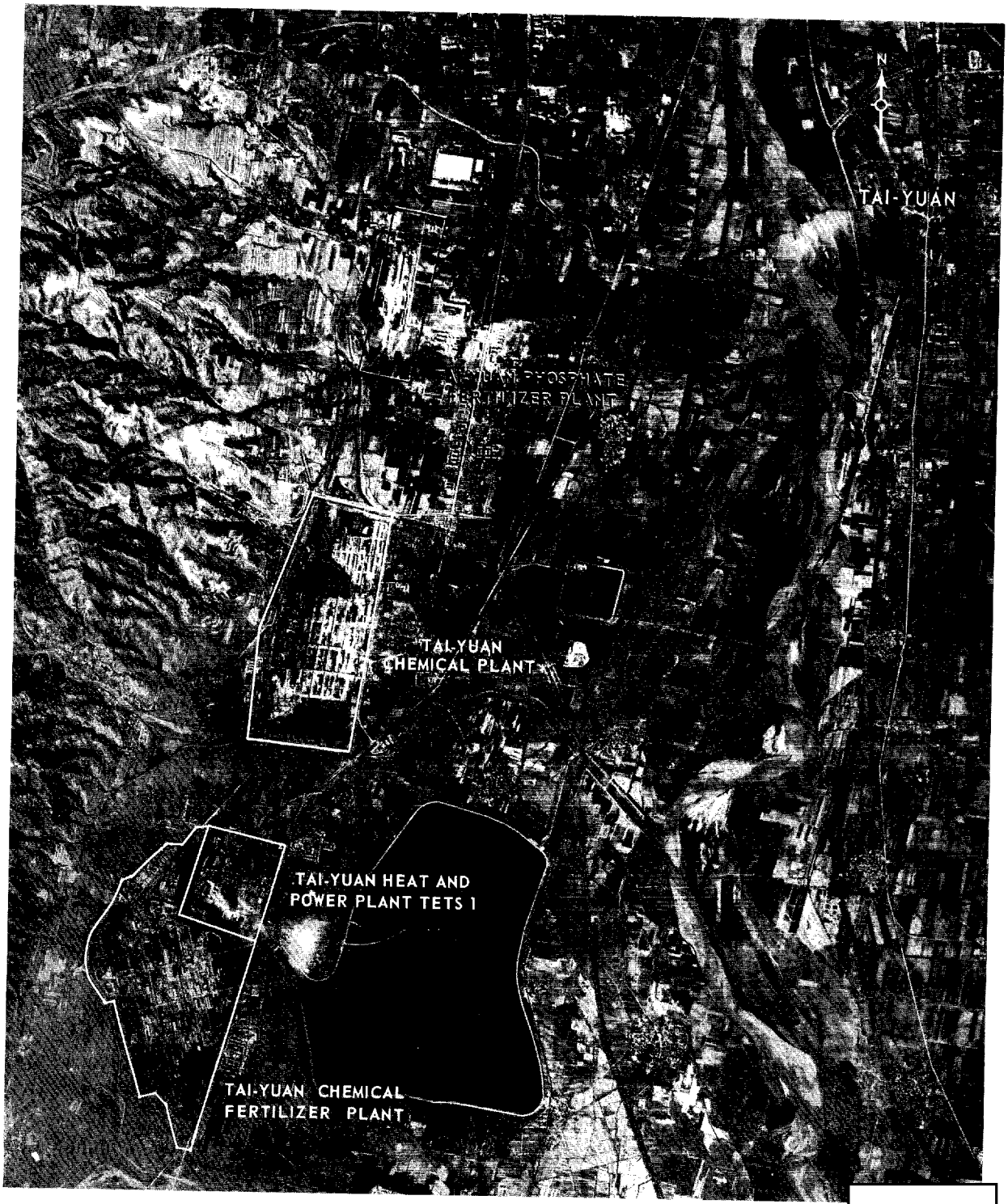

FIGURE 2. TAI-YUAN CHEMICAL COMBINE, TAI-YUAN, CHINA,

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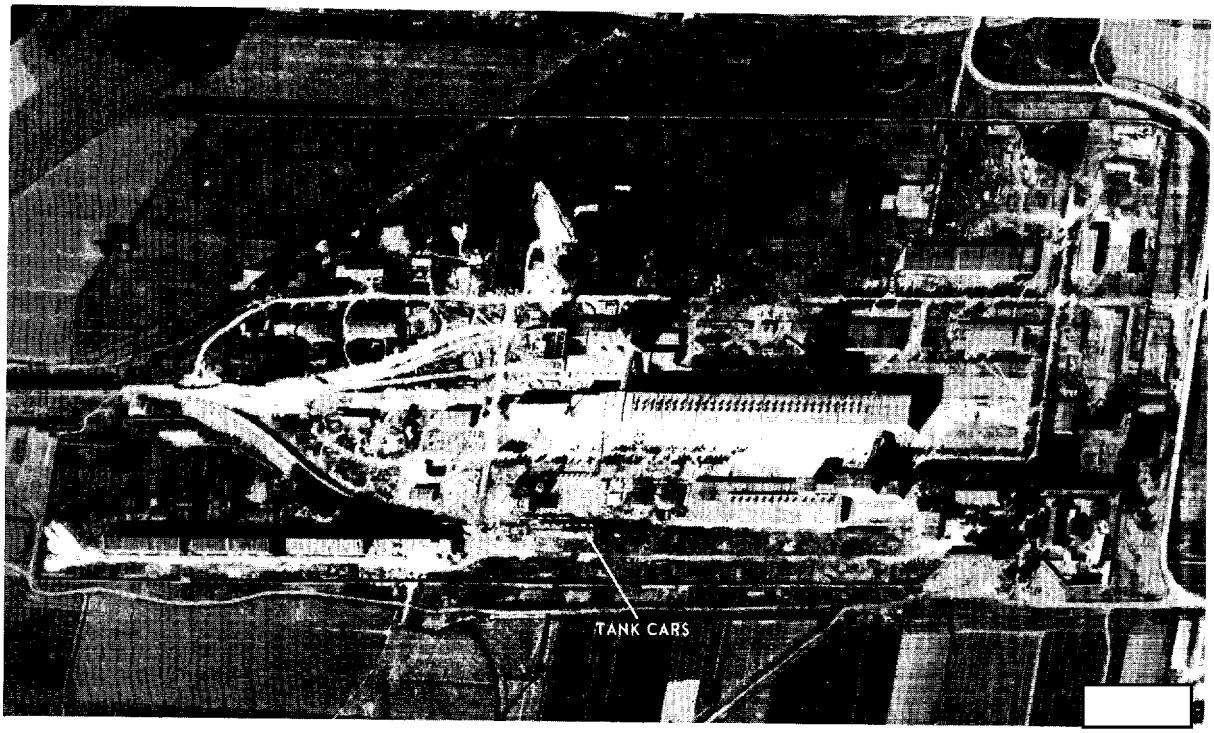
25X1D



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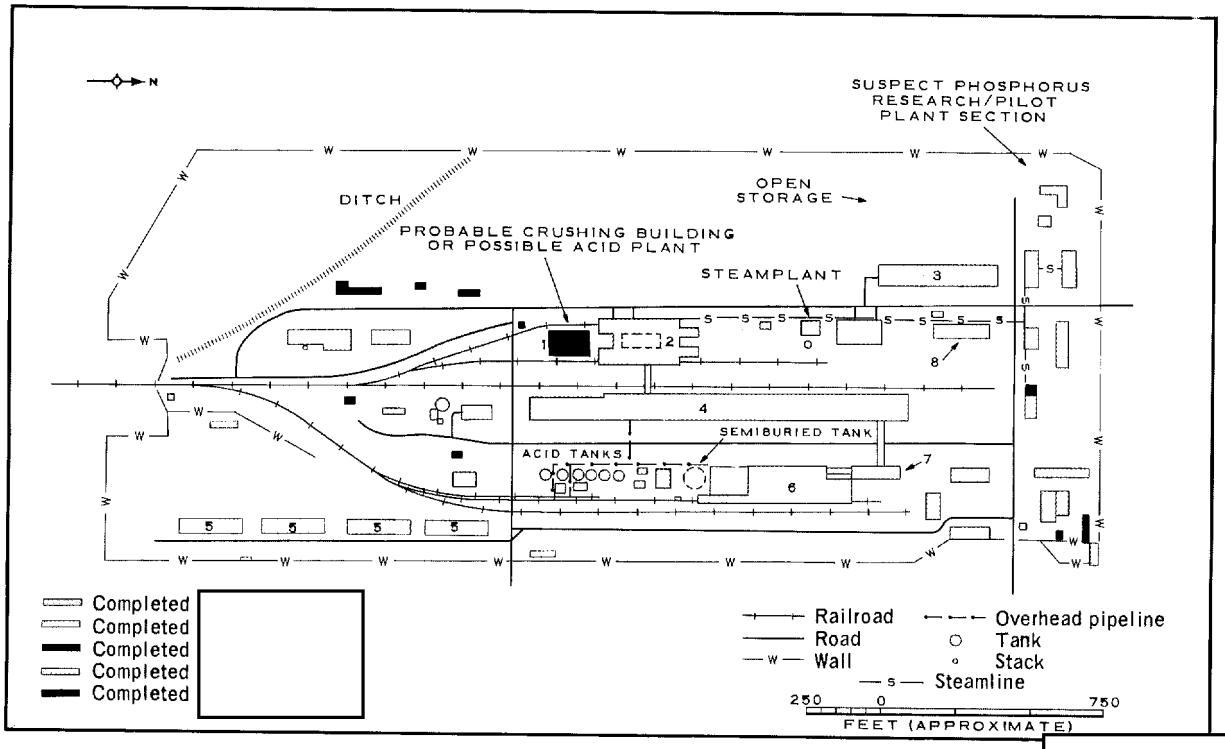

25X1D

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FIGURE 3. TAI-YUAN PHOSPHATE FERTILIZER PLANT, TAI-YUAN, CHINA.

Table 1. Description, Function and Dimensions of Major Structures of the Tai-yuan Phosphate Fertilizer Plant (Keyed to Figure 3)

Item	Description, Function	Dimensions (ft)
1	Probable phosphate rock crushing building or possible phosphoric acid plant	120 x 75
2	Phosphate storage section (Containing 2 silos)	130 x 40 x 100 high
3	Storage building	400 x 60
4	Mixing, den, and curing building	1,265 x 75 x 65 high
5	Storage buildings (4)	205 x 60
6	Final processing building	525 x 115 (overall)
7	Crushing and screening building	115 x 35 x 75 high
8	Suspect elemental phosphorus production building	185 x 50

the south-southwest, and the Tai-yuan Chemical Fertilizer Plant [redacted], about 3 nm to the south-southwest (Figure 2). 25X1A These plants, together with several smaller plants and factories, are clustered near a large artificial lake created to provide a continuous water supply. Coal and probably pyrites are mined in the mountains to the west. Phosphate rock, reportedly processed at the mine, 3/ is shipped in by rail. An elaborate rail network facilitates shipment of raw materials, chemical intermediaries, and byproducts between the components of the chemical combine and to main rail lines for distribution.

CHRONOLOGY OF CONSTRUCTION

The Tai-yuan Phosphate Fertilizer Plant is secured by a wall and covers an area measuring approximately 3,300 feet by 1,400 feet (Figure 3). A rail spur enters the plant from the south and branches to serve all major buildings. When first observed in [redacted] 25X1D the main structures of the plant were completed and appeared to be operational; however, con-

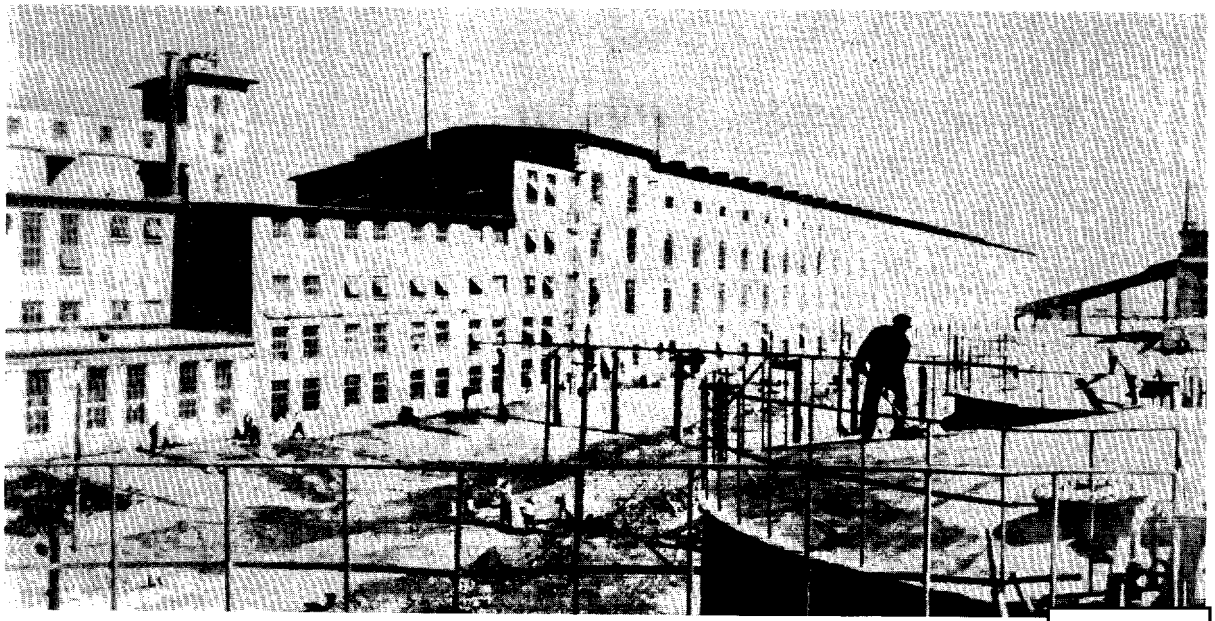

FIGURE 4. VIEW (TOWARD NORTH) OF TAI-YUAN PHOSPHATE FERTILIZER PLANT, [redacted] The acid storage tanks are visible in the right foreground, the phosphate storage silos are on the left, and the mixing, den, and curing building is in the center. 25X1 25X1D

siderable earth filling for rail beds, scattered borrow pits, building foundations, and materials in open storage showed that construction was not complete. Photography showed the plant area to have been expanded southeastward to its present size to accommodate 4 new storage buildings (item 5, Figure 3). An addition to a production building (item 6) and the completion of other, scattered buildings was also observed.

25X1D

Photography (Figure 3) is the best quality photography to date and showed 2 different types of tank cars on a spur near the acid tanks. Light-toned material along the raised rail spurs at the entrance to the plant is probably phosphate rock although some of the material may be fill from shallow borrow pits to the southwest or waste from the plant. A building with 4 small compartments (item 1) was under construction. Photography of showed this building to be completed and the plant had a more finished appearance. Additional piles of phosphate rock or waste extended past the entrance of the plant along the rail spur. Photography of showed a train of tank cars in motion at the entrance to the plant.

25X1D

25X1D

25X1D

DESCRIPTION OF PLANT

Identification of certain buildings normally associated with phosphate fertilizer production and an analysis of the production flow of materials at the Tai-yuan Phosphate Fertilizer Plant indicate 4 possibilities for the final phosphate fertilizer product: superphosphate or triple superphosphate, either or both of which could be ammoniated. A description of the structures and processes involved in producing these end products is given below. Table 1 lists the description/function and dimensions of principal structures at the plant.

Phosphate rock is brought into the plant by rail and dumped near the entrance before being transported to the probable crushing building (item 1); the phosphate is then moved to the tall storage silos (item 2). If the phosphate rock has been previously crushed at the mine, it probably moves directly to the storage silos, in which case item 1 may be a phosphoric acid plant where dilute sulfuric acid is reacted with phosphate rock; some of the piles of light-toned material near the plant may be gypsum, a waste product of this reaction. Sulfuric acid and probably urea are transported by tank car from the Tai-yuan Chemical Plant and the Tai-yuan Chemical Fertilizer Plant, respectively, and stored in tanks on the east side of the plant. Superphosphate is produced by combining sulfuric acid and phosphate rock in a mixer, then dumping the resulting slurry into a container of brick or concrete called a den for further reaction, from which the superphosphate is conveyed to a curing area. At the Tai-yuan plant the mixing, reacting, and curing processes take place within one building (item 4). After curing, the superphosphate is conveyed to a crushing and screening building (item 5), then ammoniated by spraying and mixing with urea, and finally dried and bagged in a final processing building (item 6). Triple superphosphate is produced in much the same manner as superphosphate except that phosphoric acid is used instead of sulfuric acid; urea may also be used in the ammoniation of triple superphosphate. It is possible that the superphosphate or triple superphosphate is not ammoniated, in which case the final processing building would contain only bagging facilities. Figure 4 is a ground photograph of the principal plant structures.

Suspect Phosphorus Research and/or Pilot Plant Section. This section of the Tai-yuan

Phosphate Fertilizer Plant is located in the northwestern corner of the installation. It consists of a suspect elemental phosphorus production building (item 8) and 7 associated laboratory-and support-type buildings. Most of these buildings are interconnected by steam-lines from a small steamplant that also serves the fertilizer production buildings. Four stacks or vents at one end of the suspect elemental phosphorus production building may indicate the presence of a small electric furnace which could produce limited amounts of elemental phosphorus and/or provide pharmaceutical-grade phosphorus for other components of the Tai-yuan Chemical Combine. [redacted] 25X9

[redacted] 25X9

25X1D

REFERENCES

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MAPS AND CHARTS

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ACIC. US Air Target Chart, Series 200, Sheet 0382-13AL, 2d ed, Oct 60, scale 1:200,000 (SECRET, [redacted] 25X1

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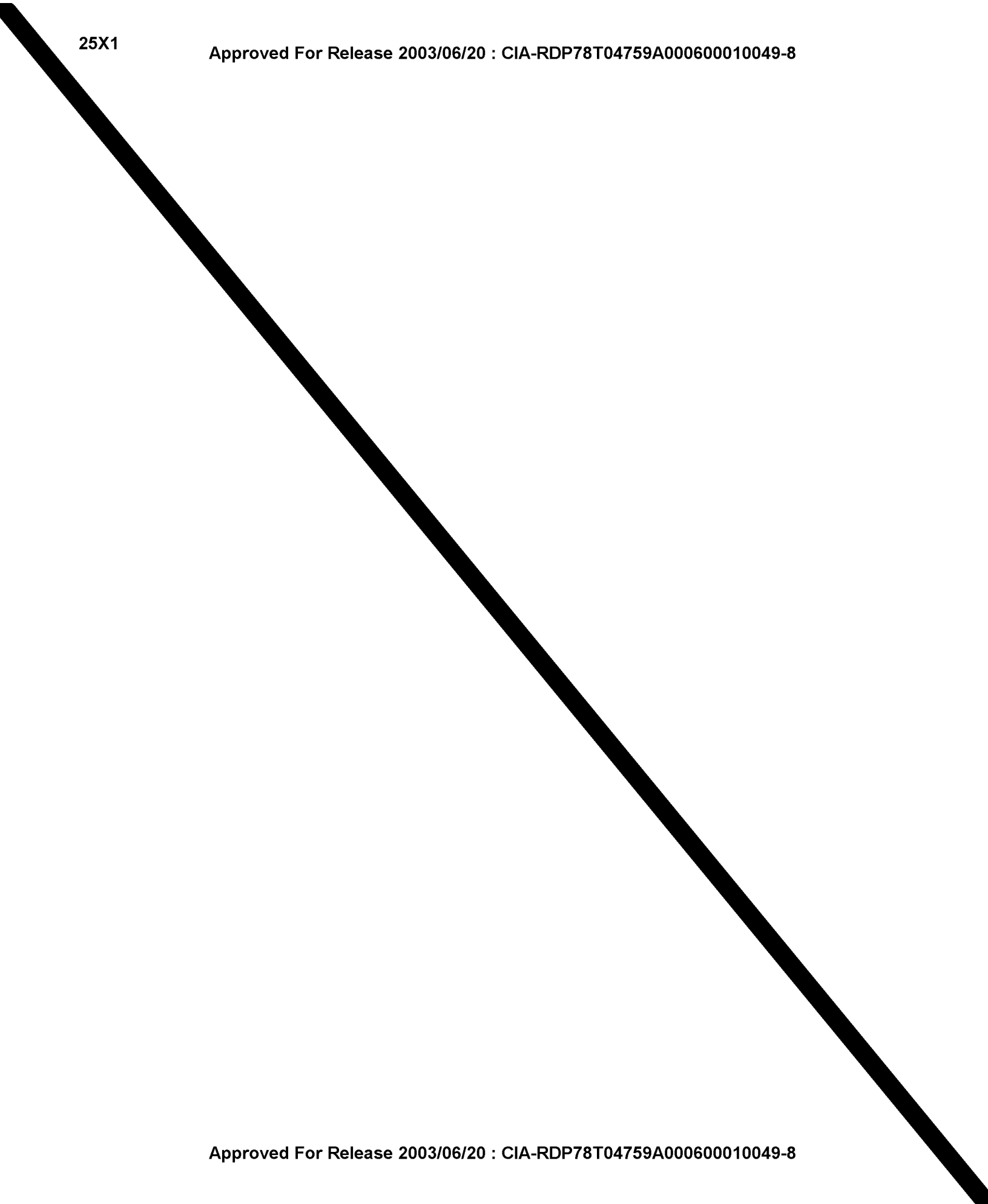
3. CIA, Industrial Register Firm No C-081533, *Tai-yuan Agrichem Pl,* Sep 58 (UNCLASSIFIED)

REQUIREMENT

CBR Task Force, TF-16 (SIC 7-64)

NPIC PROJECT

11641/64 (partial answer)



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